

Policy for Investigative Samples Related to Human Effects: Sample Submission and Analysis and Sample Collection Guidelines

Overview

**Date
established**

January 21, 2002

Attachment to

ENF 02-03
WHS 02-02

Distribution

County Agricultural Commissioners

Referrals

If you have any questions pertaining to this document, please contact your Senior Pesticide Use Specialist; Mr. Nick Surjan, Agricultural Program Supervisor II, at (916) 445-3864 or <nsurjan@cdpr.ca.gov>; or Ms. Janet Spencer, Associate Environmental Research Scientist, at (916) 445-4198 or <jspencer@cdpr.ca.gov>.

Introduction

The Worker Health and Safety (WH&S) Branch's workload for handling county agricultural commissioner (CAC) samples has increased. Lack of a consistent procedure for submitting and approving sample analysis further impedes the process.

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Overview, Continued

Purpose of this policy	This policy intends to streamline the analytical process by specifying contacts and procedures for sample approval, sample submission, and updates on status (for additional information, see Attachment 2, <i>Flow Chart for Enforcement Samples Related To Human Health Effects</i>).
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Significance of the WH&S Laboratory	This policy will explain the significance of the WH&S Laboratory's results and contains sampling guidelines to assist CACs in collecting the most appropriate samples for assessing human health effects.
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Section 1

Background

Contract with the CDFA laboratories

The Department of Pesticide Regulation (DPR) contracts with the California Department of Food and Agriculture's Center for Analytical Chemistry (CDFA laboratories) to analyze a variety of investigative samples submitted by DPR staff and the CACs. Samples include fresh commodities, clothing, soil, water, urine, swabs, tank mixes, pesticide products, and dislodgeable foliar residue (DFR).

Purpose for sampling

These samples have often been crucial in confirming violations, in assessing the nature and degree of exposure, and in guiding mitigation strategies.

Various laboratories and their functions

The CDFA Residue Laboratory, Formulations Laboratory, and the WH&S Laboratory have shared the workload of investigative sample analyses. The majority of investigative samples are analyzed by the Residue Laboratory.

- The WH&S Laboratory's primary commitment is to analyze samples submitted under contract by the WH&S Branch as part of their long-term human exposure studies.
 - The WH&S Laboratory will analyze investigative samples (e.g., clothing, urine, DFR) at the request of the WH&S Branch to assess the nature and degree of human exposures to pesticides. This information assists WH&S Branch scientists in their case classification of illnesses and injuries.
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Contributing factors to slowing the analytical process for the CDFA laboratories

There are several factors contributing to slowing the analytical process for the CDFA laboratories. These include:

- Newer pesticide products require development of analytical methods and obtaining "standards" (authentic chemicals of known purity) for control samples. This may take a significant amount of time for new products.
 - Analyses for specific analytes, common for investigative samples, take longer than standard screens.
 - CDFA laboratories have different analytical equipment, staffing levels, and priorities.
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Background, Continued

Contributing factors to slowing the analytical process for the CDFA laboratories
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- The number of clothing samples submitted to CDFA laboratories has increased in recent years. Clothing samples are the most time-consuming and difficult to analyze because of size, variety of fabrics, dyes, and other contaminants.
 - Quality control and quality assurance requirements have expanded in recent years.
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Section 2

Submitting Enforcement Samples Related to Human Health Effects

Introduction

See Attachment 2, *Flow Chart for Enforcement Samples Related to Human Health Effects*, for a visual depiction of the submission protocol.

Sample approval guidelines

- DPR Regional Offices (ROs) must authorize analyses of all investigative samples. The RO will obtain approval from the WH&S Branch if a sample is to be analyzed by the WH&S Laboratory.
 - The RO will then inform the CAC which laboratory will be conducting the analyses; the CAC will check the appropriate box, either Residue Laboratory or WH&S Laboratory on the *Sample Analysis Request Evidence Record/Sample Analysis Report (SARER/SAR)*.
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Sample submission guidelines

- **All** samples must be sent or delivered to the Residue Laboratory in order to provide consistent sample tracking.
 - The CDFA laboratories may refuse to accept samples lacking complete return addresses.
 - The appropriate paperwork must be included.
 - CAC and Enforcement Branch staff should not send or deliver samples directly to the WH&S Laboratory, even when that laboratory will eventually perform the analysis.
 - Samples not authorized for analysis by the WH&S Laboratories will be analyzed by the Residue Laboratory. The Residue Laboratory enters the sample information into its database and distributes the sample to the appropriate internal program laboratory. The Residue Laboratory database tracks samples for all laboratories performing analyses.
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Laboratory contact

- For CACs, the RO is the single point of contact for updates on sample status. RO staff will then contact the Residue Laboratory for sample analysis status.
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Submitting Enforcement Samples Related to Human Health Effects, Continued

CDEA Residue Laboratory and WH&S Laboratory responsibilities

- Most investigative samples will be analyzed by the Residue Laboratory.
- The WH&S Laboratory will generally be responsible only for analyses related to selected priority episodes, illness investigations, high profile drift incidents, or eradication projects.
- Depending on workload and sample type, the WH&S Branch may authorize the WH&S Laboratory to conduct other selected sample analyses. For example, the WH&S Branch may request the CACs to collect certain samples.

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Section 3

Analysis Requests and Significance of Results

- Sample analysis**
- When known, the pesticides expected to be present on the sample media should be listed.
 - The WH&S Laboratory generally cannot analyze samples via pesticide screens.
 - WH&S Laboratory analyses typically confirms the *identity* of pesticide residues and quantifies them within 70 – 120% of their true value.
 - Analysis of a single sample confirms the identity of the pesticide.
 - WH&S Laboratory results are generally reported as weight of pesticide per sample (i.e., micrograms or milligrams per sample).
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Section 4

Sample Collection Guidelines

**Dislodgeable
foliar residue
samples**

DFR is the most important sample in determining the potential health hazard of pesticide residues on foliage because it indicates the maximum worker exposure. It is the only matrix which can assist the WH&S Branch in evaluating when fields may be safely re-entered. When available, DFR should be collected in preference to other samples. Unlike total residue samples which evaluate weight of residue per weight of sample (ppm), DFR measures only *surface* residues in units of weight of pesticide per square centimeter of leaf area ($\mu\text{g}/\text{cm}^2$). *The WH&S Branch must know the total sample area to evaluate the hazard potential of DFR.* Further guidance on DFR sampling is provided in the Pesticide Enforcement Investigative Sampling Manual.

**DFR sample
collection
procedures**

WH&S Branch standard operating procedures specify that DFR samples consist of 40 one-inch-diameter leaf discs collected in a glass jar. If the leaves require a smaller-diameter punch, the sampler should indicate the number of discs they collected and the size of the punch used. If leaf punches are not available, then whole leaf samples should be collected. Whole leaves must be submitted in plastic bags. The sampler must write “save leaves for area measurement” on the SAER/SAR.

**Shipping DFR
samples**

All DFR samples should be shipped chilled, not frozen, and must arrive at the laboratory within 24 hours of collection. DFR samples submitted to the WH&S Laboratory will receive the highest priority for sample analysis. The complexity of the analysis will dictate the sample turn-around time.

**Clothing
samples**

Clothing samples are often collected to prove drift or exposure occurred. However, since each article is unique, clothing is the most difficult and time-consuming to analyze. Clothing gives less valuable data than DFR for evaluating human health effects. Skin swabs, surface swabs, dirt, duff, and similar homogeneous media provide more information than clothing and should be utilized when DFR samples are not practical.

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Sample Collection Guidelines, Continued

**Type of
clothing to
select for
sampling**

When possible, select clothing samples that are likely to be uncontaminated by previous exposures. For example, agricultural workers' gloves and hats may be contaminated with a variety of pesticide residues and may not provide useful information about a single brief exposure, such as pesticide drift. An exposed shirt, when available, provides more meaningful results as workers generally wear a clean shirt each day. It is critical to know where and how long the clothing has been worn.
